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What Role Can Peer Benchmarking Play in Planning for the Future of Research and Teaching Technologies?

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Abstract

Institutional leaders are asking libraries and IT units, as service providers, to provide data about service use, service quality and return on investment as they make decisions about resource allocation. In 2012, New York University developed a Peer Benchmarking Methodology for prioritizing research support needs by benchmarking themselves with more than a dozen peer institutions. The University of California at Berkeley borrowed and adapted NYU's methodology as the starting point and used it to benchmark teaching and learning services along with research services for a planning and community building initiative across the campus. Here we present the methodology and discuss the value of utilizing this benchmarking framework to concisely and clearly represent to key stakeholders where services rank compared to peers, the specifics of what it would take to improve these services, and how to prioritize resources for the best return on investment. Relative merits and possible downsides of utilizing this methodology are also discussed.

Introduction

In 2012, a team from NYU Information Technology Services (ITS) and the NYU Division of Libraries responded to a request from senior university leadership to perform a gap analysis, comparing NYU's centrally provided research support services to those of its peer institutions to assist with resource allocation as NYU works to raise its research profile. The methodology used for this, initially created and conducted at NYU, was adopted and further expanded and refined by UC Berkeley in 2013 in a multi-department initiative to benchmark and plan for both research and instructional technology services. This paper demonstrates the value and wider applicability of this methodology by bringing together both groups to compare and contrast experiences with the process, illuminate its benefits, and to suggest other applications.

Background/Problem Statement

While libraries and centralized information technology (IT) organizations have developed tools and methodologies to assess, compare themselves, and report on their services, the majority of those metrics are quantitative in nature. Some of those initiatives include: the EDUCAUSE Core Data Service,[1] Campus Computing Survey,[2] and ARL Statistics.[3] LibQUAL+®[4] is a fantastic example of how libraries are beginning to look at qualitative measures of library services, but a resource of that nature does not currently exist for teaching and learning and research technology services. Both NYU and UC Berkeley had specific contexts that supported the need for a more qualitative and service quality approach to evaluating the current state of their services.

NYU Context

New York University (NYU), founded in 1831 and located in the heart of downtown Manhattan in New York City, is the largest private university in the United States with more than 44,000 students (approximately half of which are graduate students) and 3,100 full-time faculty.[5] In anticipation of NYU's 200th anniversary, an NYU Framework 2031 initiative produced a 2006 document that defined NYU's 25-year strategic direction. One of the primary goals outlined was NYU's aspiration to become one of the top two to three dozen research universities in the world.[6]

Since 2006, NYU has started, attracted, or incorporated no fewer than eight significant new research initiatives and centers towards this goal, a trend that is expected to continue. Input from the first wave of new research faculty recruited to NYU revealed shortcomings in the central support services researchers require and in many cases had had access to at a prior institution.

In Spring 2012, a request was made by the senior vice provost for research for NYU's central Information Technology Services (ITS) and the NYU Division of Libraries to jointly "conduct a gap analysis of the IT-related services provided for researchers at those institutions from which faculty are likely to be recruited as part of the Science Initiative and from CUSP partner institutions." [7]

Essentially, what research-related services would new faculty expect NYU to provide, based on their experiences at their previous institutions? How did NYU's research services compare to those at the other universities it considered its peers? To answer these questions, our team in ITS and the libraries devised a plan to benchmark our services against those at other universities.

NYU's Development of the Methodology

The term "benchmarking" describes a method used by an organization to compare itself to peer organizations or others with the goal of understanding best practices and metrics, and gauging its performance against others. Although at one time benchmarking focused mainly on imitating others, more recently the focus has turned to acquiring explicit/tacit knowledge for the purposes of innovation: this new knowledge, "once integrated with previous internal knowledge of the firm, creates new knowledge that may give rise to improvements and innovations."[8] Utilizing an external, strategic/competitive benchmarking methodology seemed well suited for comparing NYU's research services to those of its peer institutions.

Resources Summary

NYU approached its benchmarking project by forming a core strategic team to devise a methodology and steer the project. This core team was comprised of six representatives from ITS and the libraries, including the dean of the libraries and the CIO in ITS plus high-level directors of staff who provide research services of some kind. In addition to the strategic team, fourteen total subject matter experts (SMEs) from several departments in ITS and the libraries were dispatched to carry out the data gathering and analysis in their areas of specialty. We estimate that approximately 1,000 person-hours were dedicated to the entire process over a three-to-four-month period.

1. Selecting Peers

The first step of the peer benchmarking process was to define and select which institutions we consider "peers." NYU's peers were selected by the project's strategic team, who used prior knowledge, as well as findings from some preliminary research, to select fourteen institutions to use for the investigation. These 14 (University of California at Berkeley, Cornell University, Columbia University, Duke University, Carnegie Mellon University, Princeton University, University of Southern California (USC), Johns Hopkins University, University of Toronto, University of California at San Diego, Indiana University, University of Pennsylvania, and University of Michigan) included public and private institutions of similar size to NYU and with similar science research profiles, plus several partners in the Center for Urban Science and Progress (CUSP) initiative.[9] Many of these are considered "aspirational peers"—that is, they may not identify NYU as a (research) peer today, but NYU strives to be in their league in the near future. The Polytechnic Institute of Brooklyn, while not considered a peer by our measures, was also included in the analysis, since it was about to be incorporated into NYU as the Polytechnic School of Engineering.

2. Selecting Services

NYU's Strategic Team was responsible for selecting the research services to be included in benchmarking, although input from the subject matter experts was also taken into consideration. The thirteen services selected drew heavily from existing services provided centrally by the libraries and ITS at NYU, but also added others that were either provided on a limited basis by schools or departments or were simply not part of our portfolio yet, but likely would need to be eventually. These thirteen services, plus NYU's criteria for benchmarking them, are listed in Appendix A.

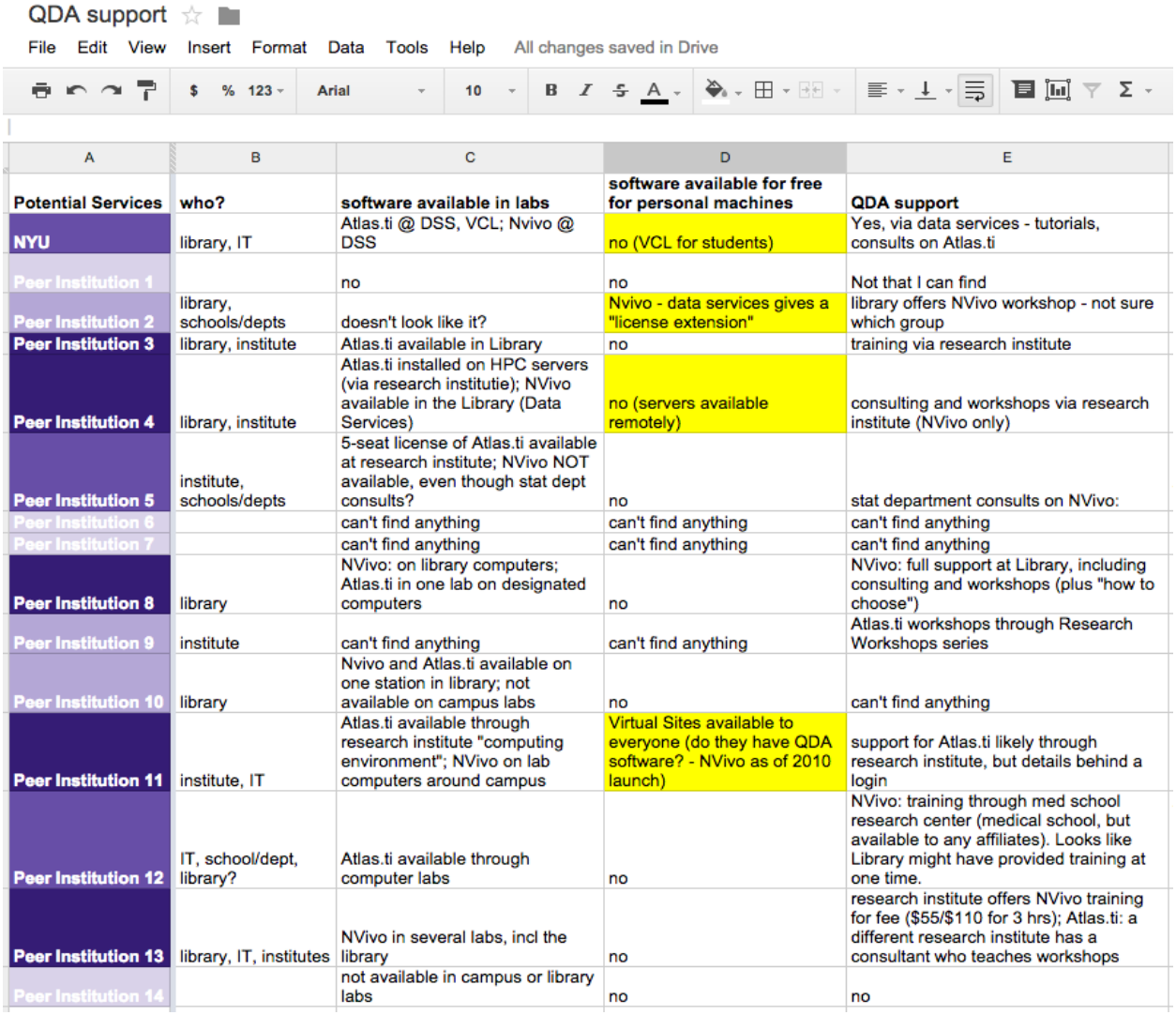
3. Gathering Data

Each of the fourteen SMEs worked alone or in pairs on one to four services related to their main roles

at NYU; for example, the GIS specialist worked on benchmarking GIS-related services. The SMEs met several times with a member of the strategic team, who explained the goals of the project and the general guidelines for his or her assignment, and a general guidelines document was created and circulated by the strategic team as well. Aside from that initial guidance, however, SMEs were largely encouraged to use their subject area knowledge to shape their data collection and criteria. Most SMEs constructed their benchmarking criteria based on what they found by exploring services at the other universities; they did not begin with lists of what they were looking for, but constructed those lists iteratively throughout the investigation. The NYU team also looked at services available to every faculty member at that institution (not including those requiring specific school or department affiliations), and limited the investigation only to web searching and exploration, in an attempt to mimic a faculty member's discovery process.

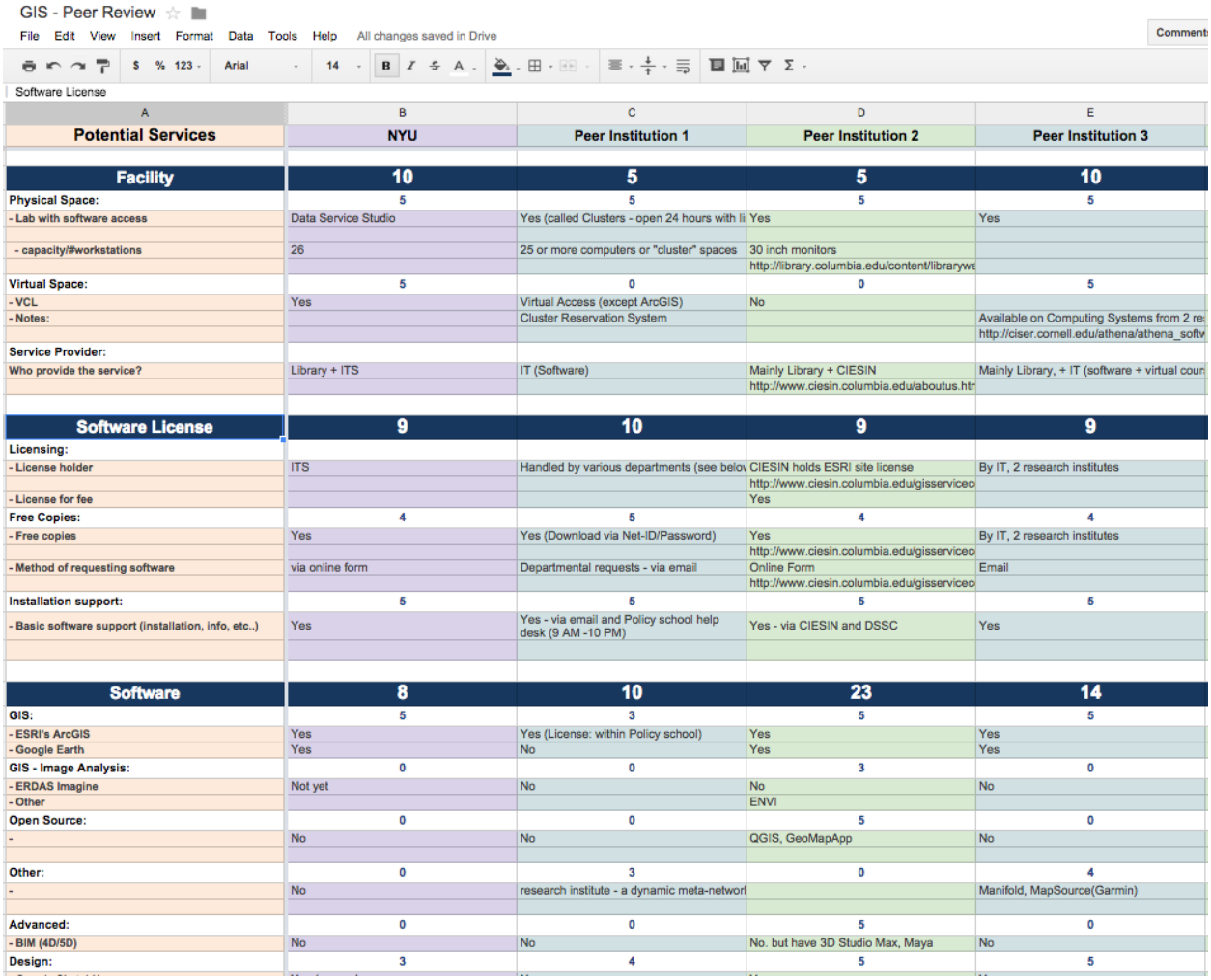
This process resulted in a variety of qualitative and quantitative data collected by each SME, and some services had much more complex data capture systems than others (related to the complexity of the service itself). Figure 1 shows an example of a service with a more "simple" data capture scheme, while Figure 2 illustrates the initial data capture for a more complex service.

Figure 1. Service with "simple" data capture



	A	B	C	D	E
	Potential Services	**who?**	**software available in labs**	**software available for free for personal machines**	**QDA support**
	NYU	library, IT	Atlas.ti @ DSS, VCL; Nvivo @ DSS	no (VCL for students)	Yes, via data services - tutorials, consults on Atlas.ti
	Peer Institution 1		no	no	Not that I can find
	Peer Institution 2	library, schools/depts	doesn't look like it?	Nvivo - data services gives a "license extension"	library offers NVivo workshop - not sure which group
	Peer Institution 3	library, institute	Atlas.ti available in Library	no	training via research institute
	Peer Institution 4	library, institute	Atlas.ti installed on HPC servers (via research institutie); NVivo available in the Library (Data Services)	no (servers available remotely)	consulting and workshops via research institute (NVivo only)
	Peer Institution 5	institute, schools/depts	5-seat license of Atlas.ti available at research institute; NVivo NOT available, even though stat dept consults?	no	stat department consults on NVivo:
	Peer Institution 6		can't find anything	can't find anything	can't find anything
	Peer Institution 7		can't find anything	can't find anything	can't find anything
	Peer Institution 8	library	NVivo: on library computers; Atlas.ti in one lab on designated computers	no	NVivo: full support at Library, including consulting and workshops (plus "how to choose")
	Peer Institution 9	institute	can't find anything	can't find anything	Atlas.ti workshops through Research Workshops series
	Peer Institution 10	library	Nvivo and Atlas.ti available on one station in library; not available on campus labs	no	can't find anything
	Peer Institution 11	institute, IT	Atlas.ti available through research institute "computing environment"; NVivo on lab computers around campus	Virtual Sites available to everyone (do they have QDA software? - NVivo as of 2010 launch)	support for Atlas.ti likely through research institute, but details behind a login
	Peer Institution 12	IT, school/dept, library?	Atlas.ti available through computer labs	no	NVivo: training through med school research center (medical school, but available to any affiliates). Looks like Library might have provided training at one time.
	Peer Institution 13	library, IT, institutes	NVivo in several labs, incl the library	no	research institute offers NVivo training for fee ($55/$110 for 3 hrs); Atlas.ti: a different research institute has a consultant who teaches workshops
	Peer Institution 14		not available in campus or library labs	no	no

Figure 2. Service with "complex" data capture



GIS - Peer Review

File Edit View Insert Format Data Tools Help All changes saved in Drive

Software License

	A	B	C	D	E
	Potential Services	**NYU**	**Peer Institution 1**	**Peer Institution 2**	**Peer Institution 3**
	Facility	**10**	**5**	**5**	**10**
	Physical Space:	5	5	5	5
	- Lab with software access	Data Service Studio	Yes (called Clusters - open 24 hours with li	Yes	Yes
	- capacity/#workstations	26	25 or more computers or "cluster" spaces	30 inch monitors	
				http://library.columbia.edu/content/librarywe	
	Virtual Space:	5	0	0	5
	- VCL	Yes	Virtual Access (except ArcGIS)	No	
	- Notes:		Cluster Reservation System		Available on Computing Systems from 2 re
					http://ciser.cornell.edu/athena/athena_softv
	Service Provider:				
	Who provide the service?	Library + ITS	IT (Software)	Mainly Library + CIESIN	Mainly Library, + IT (software + virtual cour
				http://www.ciesin.columbia.edu/aboutus.htr	
	Software License	**9**	**10**	**9**	**9**
	Licensing:				
	- License holder	ITS	Handled by various departments (see belov	CIESIN holds ESRI site license	By IT, 2 research institutes
				http://www.ciesin.columbia.edu/gisserviceo	
	- License for fee			Yes	
	Free Copies:	4	5	4	4
	- Free copies	Yes	Yes (Download via Net-ID/Password)	Yes	By IT, 2 research institutes
				http://www.ciesin.columbia.edu/gisserviceo	
	- Method of requesting software	via online form	Departmental requests - via email	Online Form	Email
				http://www.ciesin.columbia.edu/gisserviceo	
	Installation support:	5	5	5	5
	- Basic software support (installation, info, etc..)	Yes	Yes - via email and Policy school help desk (9 AM -10 PM)	Yes - via CIESIN and DSSC	Yes
	Software	**8**	**10**	**23**	**14**
	GIS:	5	3	5	5
	- ESRI's ArcGIS	Yes	Yes (License: within Policy school)	Yes	Yes
	- Google Earth	Yes	No	Yes	Yes
	GIS - Image Analysis:	0	0	3	0
	- ERDAS Imagine	Not yet	No	No	No
	- Other			ENVI	
	Open Source:	0	0	5	0
	-	No	No	QGIS, GeoMapApp	No
	Other:	0	3	0	4
	-	No	research institute - a dynamic meta-networl		Manifold, MapSource(Garmin)
	Advanced:	0	0	5	0
	- BIM (4D/5D)	No	No	No. but have 3D Studio Max, Maya	No
	Design:	3	4	5	5

A	B	C	D	E
Potential Services	**NYU**	**Peer Institution 1**	**Peer Institution 2**	**Peer Institution 3**
Software Support	**10**	**2**	**18**	**17**
Tutorials/Training/Training Resources:	5	0	5	5
- Tutorials/Classes	Yes	No	Yes + topic specific sessions like geocodin	Yes + topic specific sessions via 3 libraries
- Training Materials/Docs	Yes	No	Yes	Yes + GIS Help and Tutorial
- External resources for learning	Yes	No	Yes	Yes
- ESRI Virtual Campus	Yes	No	Yes, register via online form - requires Net-	Yes - request via email
Extensive Training:	0	0	0	5
- Long workshops / classes	No	No	No	Yes - ESRI instructor led courses via IRIS
Consultation:	3	0	5	3
- Free Consultation	Yes	No	Yes	Yes
- Support for fee	No	No	Yes - via research institute	No
Methodological support:	0	0	3	0
- Methodology	No	No	Maybe via research institute	No
Mapping Services:	0	0	0	0
For faculty/staff/student	No	No	No	No
Web presence:	2	2	5	4
- Website	Yes - Data Service Studio, NYU GIS Servic	Yes	Yes - Library, research institute + links to o	Yes + links to other GIS research centers +
	http://nyu.libguides.com/dataservicestudio,			http://www.library.cornell.edu/olinuris/ref/m
- Blogs / list-serve/News	List-serve	No	Yes - GIS specialists from 3 research instit	GIS help and tutorial page
			https://blogs.cul.columbia.edu/culspatial/	
Other Features:				
-				Links to ESRI instructor led courses offered
Spatial Data	**7**	**0**	**21**	**25**
Spatial Data Repository:	2	0	2	5
- SDR	Yes (Basic / limited)	No	Yes (Download using Net-id/Pswd)	Yes - online repository in the National Spat
Spatial Data Collection:	2	0	5	5
- SD Collection	Yes - very basic	No	Yes (Quite good)	Yes (by default)
- Contributed/Research data	under planning	No	Yes	Yes
- Customized data	No			Likely
Search and Discovery Environment:	1	0	5	5
- Search/Discovery/Catalog	Very basic via website	No	Yes - seperate calatog	Via libraries and repository
	http://nyu.libguides.com/GIS			
External Spatial Data Resources:	1	0	4	5
- External resources	Limited	No	Yes	Yes - extensive

4. Creating Tiers

The next challenge was to collapse all of the rich data collected by the SMEs into something much smaller and more easily understandable by non-specialists. All of the SMEs compiled interim reports, which provided summaries of the service offerings across the peer institutions, indicators of what were the strongest service models for a given service area, and how each of the peer institutions stacked up. Figure 3 shows an example of one of these interim reports:

Figure 3. Interim Report for one service

Research Peer Benchmark Analysis: GIS Services

DSS conducted website review of 14 peers of NYU (+NYU-Poly) for centralized GIS services. Various aspects of the GIS services were researched, compared and rated with respect to services provided at NYU and NYU Poly. (Tiers include 1 being lowest level of service and 4 being highest level of service). The following criteria were used to rate and compare GIS services: *facility, software licensing, software types, software support, spatial data and full time staff /e-xpertise*. Please note that NYU Poly is not explicitly discussed in the summary as it falls below the four Tiers in almost all criteria. The website review reveals following information:

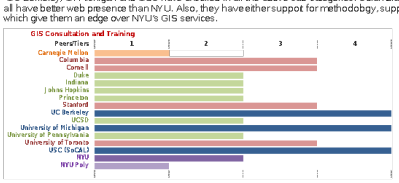
GIS Services Providers:
GIS Services are provided by mainly three types of entities: Library, IT and/or Department/Institute.

For the most institutions, the centralized GIS services are provided via Library in conjunction with software access via IT, while Columbia, Duke, U. Michigan and USC have departments/research institutes that provide GIS services in conjunction with Library or IT or both. UC Berkeley provides GIS services via Geospatial Innovation Facility.

Highlight:
Institutions with services supported via departments or institutes have more dedicated and advanced resources to support GIS services.

GIS Consultation and Training
This is the key category of GIS services, and was analyzed with several sub-categories namely:
Tutorials/classes (1-1.5 hour classes), tutorial documentation, access to ESRI's Virtual Classes, access to other online resources for learning GIS, 2+hour workshops, free consultations, support for fee, methodological support (concepts beyond just learning a software e.g. How to do spatial research?), mapping service for faculty, web presence (dedicated website, blogs, list-serve news..), and other features ..

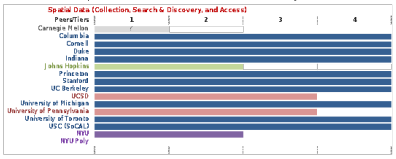
[1]UC Berkeley, U. Michigan and USC have excelled in all the above sub-categories. Columbia, Cornell, Stanford and U. Toronto – all have better web presence than NYU. Also, they have either support for methodology, support for fee and/or longer workshops, which give them an edge over NYU's GIS services.



Despite NYU is in Tier 2, it is in the lower scale than its peers (Duke, Indiana, Johns Hopkins and UCSD) in the same Tier 2 except U. Penn. Carnegie Mellon is at the lowest scale along with NYU Poly.

Highlight: Staff is the limiting factor for NYU to meet increasing demand for consultations, training levels and offerings to match Tier 4 institutions, which is the core of the GIS services.

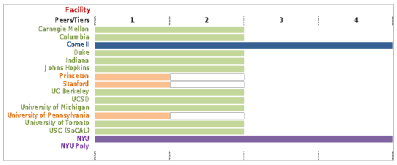
Spatial Data: Collection, Search & Discovery, and Access
This is another key category of GIS services, and was analyzed with several sub-categories namely:
Availability of Spatial Data Repository (SDR), active spatial data collection (includes contributed data from researchers and customized data for patrons), dedicated and robust search & discovery environment, external spatial resources and map collection.



Majority of the institutions except Carnegie Mellon, Johns Hopkins and NYU, has a very good standing in this category. UCSD and U. Penn do not have SDR, but have great search & discovery environment, external spatial data resources and/or great map collection.

Highlight: NYU has limited collection, rudimentary search & discovery environment, and very basic external spatial data resources webpage.

Facility:
Dedicated physical space like computer lab, and virtual computer lab (VCL) or clusters are important components of GIS services.



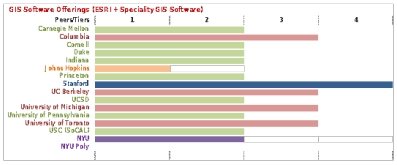
[1]NYU and Cornell have both computer lab and VCL/cluster access for GIS software, while most institutions have decent size dedicated computer labs. Princeton U., Stanford and U. Penn have computer lab with 7 or fewer workstations.

Highlight:
VCL or Cluster access is critical with current cloud computing trends and NYU has a slight edge over its peers.

Primary GIS software (ESRI) and Other Specialty GIS Software Offerings:
GIS has an extremely vast field of applications and disciplines. Institutions that provide a variety of GIS products that can do specific and specialized analysis are considered to have more resources and expertise in the GIS field. For this summary report, GIS software is categorized as ArcGIS (ESRI), Image Analysis, Open Source, Advanced GIS, Design, and other types.

Almost all institutions including NYU distributes free ESRI software, (which is the market driver), and installation support to faculty, students and staff, except U. Penn, which only provides information for faculty for how to obtain free student copies from ESRI.

On the other hand, Stanford, Columbia, UC Berkeley, U. Michigan and U. Toronto have aced the type of GIS software category. Johns Hopkins provides the basic ESRI software while the remaining 9 institutions including NYU hold Tier 2.



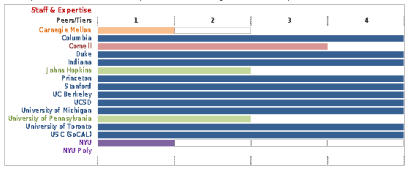
Highlight: Carnegie Mellon, Stanford and U. Toronto distribute the software via download. NYU should aim for such automated download method of distribution.

NYU has a few software (with limited licenses) lined up for purchase in the upcoming semester, which will put NYU in Tier 3. However, with limited staff, the support will be extremely limited.

Staff / Expertise:
The primary difference in the Tier levels is indicated by staffing levels. Staff (full-time) with necessary expertise and title defines the nature and depth of GIS services provided in an institution. In a Tier 4 institution, generally the following expertise to constitute a good team for GIS services: *GIS Expert, GIS Metadata Librarian, GIS (Spatial Data) Librarian, GIS App. Developer, and a Map Librarian.*

A vast majority of our peer institutions falls in Tier 4, and have either a robust team and / or an entire departmental staff to support advance GIS services. Johns Hopkins and U.Penn. fall in Tier 2 with more than 2 full time staff and part of Data Services librarian. NYU falls at the most bottom category i.e. Tier 1 with a minimal staffing (1 GIS expert +0.35 Data librarian).

With respect to GIS Librarian staff - Columbia, Cornell, Duke, Indiana, Princeton and U. Toronto have at least one GIS Librarian on board. Stanford has a Geospatial Manager and UCSD has a GIS Coordinator – both housed within their respective libraries and are equivalent to GIS Librarian positions. U. Michigan has three Spatial and Numeric Data librarians. UC Berkeley provides GIS services via Geospatial Innovation Facility and USC provides GIS Services via Spatial Science Institute.



Carnegie Mellon, Johns Hopkins, U. Penn and NYU do not have a GIS Librarian or equivalent staff.

Highlight: NYU needs more staff - at least a full-time GIS librarian to start with.

The interim reports made it much easier to quickly understand where NYU stood within each service area compared to its peers. However, it became clear at this point that if these reports were going to be shared with people who had limited time and limited understanding of the nuances of these services, we needed to come up with a way of standardizing the reports so that all of the service area summaries had the same format and would be easy to digest relatively quickly.

At least one of the SMEs was already converting some of his qualitative evaluations into a numeric ranking system; based on this idea, the tiered method was created. By this point, each of the SMEs (or teams) had a fairly good impression of which institutions were the best in their area, so they were asked to identify the characteristics that those top-tier institutions had in common (that is, the things that put them in the top-tier). These characteristics could be things like relatively high numbers of staff, the training level of staff members, support for methodological research, the number of software packages supported, quantity or quality of training offered, the existence of a facility, and the availability of walk-in help, just to name a few. After the top tier qualifications were identified, SMEs used the same principles to determine what would represent a tier lower for that service, and so on.

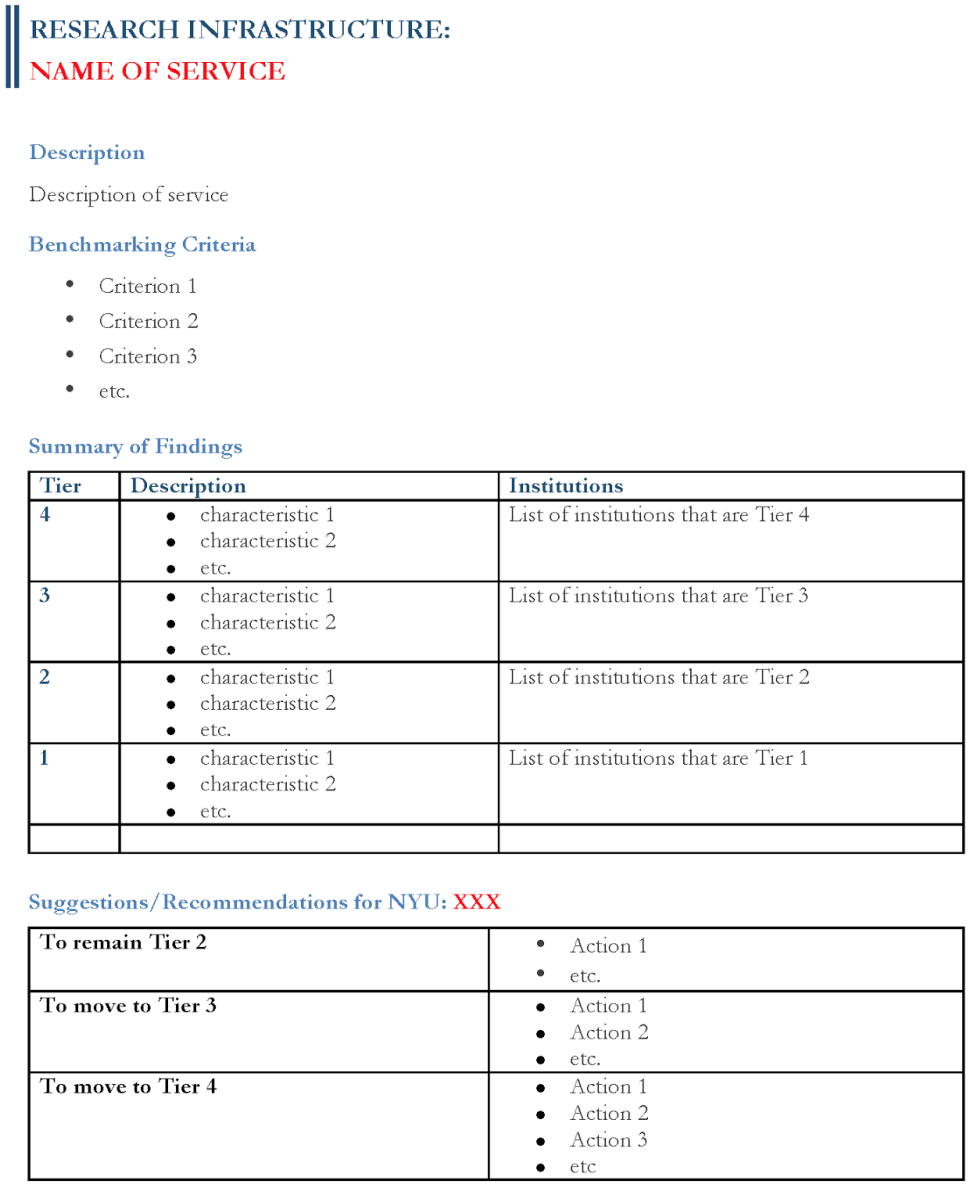
All of the peer institutions, plus NYU, were then distributed among four tiers for each service area, helping to clearly identify where NYU stood across all of the services relative to its peers. It also helped the strategic team focus on the specifics of what it might take for NYU to move up into a higher tier, what it would take for NYU to remain in its current tier (which could require additional resources to meet the increased demands associated with greater numbers of researchers), and then to prioritize next steps based on these specifics.

In most of the service areas explored, NYU did provide many of the service dimensions, but had fewer staff providing the support than the higher-ranked institutions, sometimes substantially fewer. This lower level of staffing usually resulted in less breadth and/or depth of a service offered. The tiered process was also somewhat iterative: the general approach was to distribute the peer institutions among four tiers by the distinct observed service offerings, but sometimes that was inadequate in representing tiers of service level. In one case, the strategic team and SMEs knew what a top-tier service provider could offer based on services at other institutions. Even though those institutions were not among the peers NYU had chosen for this project, it was decided that information should be captured by defining our highest tier using the criteria observed there—meaning that none of NYU's peer institutions were listed as being in the highest tier for that service. In another case, the service level provided by multiple top-tier institutions far exceeded the next observed service level. In that case, the team defined the second-highest tier with characteristics that none of the peer institutions exhibited, thereby creating a goal for improvement that was more reasonably attainable than the highest tier.

5. Summarizing

Even after the tiered process standardized the output considerably, the results still needed to be arranged into a presentation format. The strategic team designed a two-page format and finally a one-page format that included a service description, criteria used for assessments, tier rankings, and recommendations, and the SMEs and an administrative assistant worked to incorporate each service area into this format.

Figure 4. Format of one-page summary



RESEARCH INFRASTRUCTURE:
NAME OF SERVICE

Description

Description of service

Benchmarking Criteria

- Criterion 1
- Criterion 2
- Criterion 3
- etc.

Summary of Findings

Tier	Description	Institutions
4	• characteristic 1 • characteristic 2 • etc.	List of institutions that are Tier 4
3	• characteristic 1 • characteristic 2 • etc.	List of institutions that are Tier 3
2	• characteristic 1 • characteristic 2 • etc.	List of institutions that are Tier 2
1	• characteristic 1 • characteristic 2 • etc.	List of institutions that are Tier 1

Suggestions/Recommendations for NYU: XXX

To remain Tier 2	• Action 1 • etc.
To move to Tier 3	• Action 1 • Action 2 • etc.
To move to Tier 4	• Action 1 • Action 2 • Action 3 • etc

6. Presentations

All of the SMEs, the strategic leadership team, and other interested parties were invited to a round-robin style session of presentations, which took place in August 2012. SMEs presented short summaries of their process, the criteria they came up with, and why they reached their conclusions and recommendations. This session was informative for the senior leaders who were present, but also for all of the SMEs who had been working relatively separately, aside from a few small group meetings during the project. In addition to sharing findings and feedback about the project itself, it was also a valuable opportunity to learn more about others' day-to-day work and the various trends and concerns across all of the service areas.

7. Response to Original Request

With the completed "one-pagers," the supporting information from the more robust interim reports, and input from the presentations, the strategic team had the information they needed to respond to the original request for a gap analysis

of NYU's centrally provided research services. The dean of the libraries and CIO of ITS wrote a report and presented the findings to the senior vice provost for research and the research deans from NYU's schools and colleges in a key meeting to address issues related to expanding NYU's research imprint. The praise from this group was high; they said that the overall benchmarking methodology used was extremely effective and easy to understand. The standardized "one-pagers" summarized a lot of information that could have been difficult to convey and compare. This output enabled them to get to their task of prioritizing which service areas to distribute limited funds to immediately and to envision the path it would take to have a more robust central research support infrastructure in line with those offered by NYU's peers over the next several years.

Berkeley Context

UC Berkeley is a public research institution and the flagship of the University of California. There were 36,204 students as of fall 2013, including 25,951 undergraduates and 10,253 pursuing graduate degrees and 1,620 full-time and 616 part-time faculty members dispersed among more than 350 degree programs.[10] Public monies for the UC system have continued to make up a smaller portion of funding and in 2012 it accounted for just 12% (down from 34% in 2002), and at the same time, the amount of available research funding has declined.[11] The campus has moved to a data-driven decision-making model and in order to make funding decisions in the research and teaching and learning technology areas, it was imperative that we be able to provide a framework for those decisions.

Berkeley's Adaption of the Methodology

The University of California at Berkeley (Berkeley) took the NYU framework and adopted and adapted it to fit their institutional context and needs. Also, because Berkeley understood what the end product was—the one-page summary report—they had a head start on how to approach the work. It was approached as a project from the beginning and a project manager was assigned to coordinate the benchmarking process. The goal of the project was to ensure that UC Berkeley maintains the highest quality services to support research and teaching by:

1. benchmarking Berkeley technology services with peer institutions;
2. developing a set of recommendations around future resource realignment and investments; and
3. fostering collaboration and a shared understanding across domains and service areas.

Building on the goal to foster collaboration across units, Berkeley engaged multiple partners in this effort. The project team had members from the following units across campus: Educational Technology Services, Research IT, Libraries, Berkeley Resource Center for Online Education, and Infrastructure and Platforms IT. The full group was about 30 people from across those units with the core team sized at about 20 members. They also built in project meetings every two weeks for the full group. These meetings were used to brainstorm criteria, share ideas about process, coordinate outreach to other institutions for data gathering, and, most importantly, to iteratively share findings with a broader group to get input, insights, and suggestions early on. Each team presented on their initial findings at least twice and then presented their final "one-pager," including suggested strategies for investment to move Berkeley to higher tiers.

The team also took the data gathering one step further by creating what they called "deeper dives" which were targeted phone calls and e-mail outreach to certain schools that the teams needed more information from to tier them appropriately or find out more information about "exemplars." This produced a much richer picture of service offerings and enabled teams to refine criteria and rankings even further (see Appendix B for Berkeley's service list and definitions).

NYU and Berkeley took this revised methodology and worked together to develop a short document, "Peer Benchmarking in 13 Steps" that outlines the process in a succinct way.[12]

Outcomes

What Went Well

There were a number of things about this benchmarking methodology that worked very well. One significant benefit was the way the project empowered the staff members who served as subject matter experts, many of whom were junior level. The process recognized their expertise and gave them the opportunity to interact with

and make recommendations directly to senior leadership, while allowing them to learn more about the service models, have wider conversations in their service areas, and set evidence-based goals.

Likewise, the seminar or workshop-style sharing of results was very valuable. Input from everyone involved made the process iterative at every step, and at NYU only in retrospect did the strategic team realize that even more interaction among SMEs during the process would have been ideal for information sharing and improving the process. Berkeley capitalized on this realization and held biweekly meetings with the full team and the SMEs for every service area presenting their findings at two different stages of the project at these meetings. This interaction helped staff and leadership at both institutions understand that these relationships were important. Sharing results together was also instructive for the team members, many of whom began the process not knowing about all the service areas or who provided them.

NYU's team did not interact with the service providers at peer institutions, but making those connections would have been valuable as well, and Berkeley decided to add this element when they embarked on their own benchmarking project.

While the benchmarking methodology presented here may sound complex, and certainly involved a lot of coordination of staff and stakeholders, its simplicity was ultimately one of its strong points. The schema for organizing the data made the criteria and recommendations accessible to stakeholders and much easier to compare across areas and prioritize future plans. The methods were easy for staff to use and easy to explain to leadership. The level of detail in the data allows decision makers to create a multi-year roadmap (not everything needs to be done at once) and create an overarching strategy for improving research services and teaching and learning services on campus.

Tangible Outcomes

Based on the work done using this methodology (and the resulting recommendations from senior leadership), central research services at NYU allotted three new FTE positions during the first fiscal year after the conclusion of the benchmarking project. As predicted, ITS and library staff continued to feel the impact of NYU's new science initiatives across nearly all of the service areas that were benchmarked. By the second fiscal year, all three of the original new positions had been filled, and three additional new FTE positions were allotted, all for building infrastructure and services to help researchers manage and preserve their research data (these all came directly from the outcome of the benchmarking work as well). After the departure of the director of e-systems and research services in ITS (who also served as co-director of data services), her position was redefined to focus solely on supporting research (including high performance computing and data services).

Berkeley has used the benchmarking framework and data as a way to spark institutional investment conversations on the campus with both leadership and service teams. It is being used as the basis for the research and teaching and learning IT strategic planning process. It has already supported the decision-making process regarding the allocation or reallocation of resources particularly in the high performance computing and collaboration tool areas.

Challenges and Limitations

Despite the many positive outcomes, the methodology presented here does have some limitations, and it is important to be upfront about these.

First, the time commitment is significant and should be one of the primary considerations when considering a benchmarking project of this scale. Both NYU and Berkeley felt it was worth the time spent, but both consumed at least 1,000 person-hours to complete the projects. Using subject experts usually equates to a large project team, meaning that more time must be allocated for training and management.

We are also aware of at least a few potential biases that could impact the data collection process, especially since the subject matter experts doing data collection are invested in the topic and the outcomes of the investigation. We describe these as: *self-flagellation bias*, in which an SME might rate his or her own institution lower because they are more critical of their own service and in turn may unintentionally imply the need for more funds; the *"grass is always greener on the other side" bias*, in which other institutions' services

seem more impressive than they are because they are superior to our own; and *presentation bias*, in which attractive websites and well-presented materials could be seen to correlate with high-quality services. In addition to these biases, staff members also feel responsible for the quality of the services they provide, and may inappropriately conclude that their service being in a lower tier means they are doing a poor job in their work. Managers should be especially cognizant of this last point and reinforce frequently to team members that benchmarking is for the purpose of evaluating service models, not evaluating staff performance.

Furthermore, the benchmarking process itself has some inherent limitations. One is that the practice of benchmarking is usually described as a cyclical process, repeated periodically over time and incorporated into routine business practices—and not a one-time activity.[13] This is especially germane in IT and library research services, since many if not all of them are constantly evolving, and other institutions are growing and changing their services at the same time we are. NYU approached research peer benchmarking as a succinct project, but is aware that revisiting it in the future would be wise.

We recognize that presenting data in "tiers" makes this exercise look more rigorous than it is, and that many of the service area definitions are somewhat amorphous and have dependencies on each other, so cannot be isolated in practice the way they were isolated here for analysis and prioritization. Another limitation is in our approach to data collection: SMEs built their ideas of a high-quality service based on those currently in existence at NYU/Berkeley or its peer institutions. This approach assumes that the top-tier institutions have everything, meaning that we were likely to omit any service characteristics that are very cutting edge or uncommon. Finally, our investigations focused on services available centrally to everyone. In reality, faculty members likely do not care whether a service is available centrally or from a department or school, only whether it is available to them. We necessarily made this tradeoff, knowing that we have the most potential impact on services offered centrally at NYU and that centrally offered services tend to be more cost effective.

Next Steps

The comparative conversations between NYU and Berkeley about how, who, why we did this have been fascinating and helpful. Having a common, flexible methodology that a campus can adapt and work on its own while coming together at the right moments with others could be very powerful. The team is looking to socialize this framework and methodology with other institutions to see if they are interested in utilizing it and creating a larger community of practice to share improvements and perhaps even results.

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